National Institute of Environmental Health Sciences

The management of Lake Burragorang in a changing climate: The application of the Index of Sustainable Functionality

Author(s): Kristiana R, Vilhena LC, Begg G, Antenucci JP, Imberger J
Year: 2011
Journal: Lake and Reservoir Management. 27 (1): 70-86

Abstract:

Lake Burragorang is the largest water supply source for the Sydney region, providing up to 80% of Sydney's water supply. The Index of Sustainable Functionality (ISF) was applied to the geographical domain of its catchment (Warragamba Catchment) for the 20 year period from 1989 to 2008 as a measure of its health and sustainability. The ISF values showed a slight negative trend over the study period, indicating decreasing functionality of the reservoir; however, climate variability, especially its effect in significantly decreasing the lake water level, played a dominant role. The effect of water level on the occurrence of an algal bloom event in 2007 was investigated using the Estuary, Lake and Coastal Ocean Model coupled with the Computational Aquatic Ecosystem Dynamics Model (ELCOM-CAEDYM) simulations. Results reinforced the dominant role played by water level, demonstrating that at a higher water level (an increase of 20 m) the bloom may not have occurred. Increased alertness and more rapid response to prevent events such as algal blooms could be achieved through the use of ELCOM-CAEDYM combined with the ISF.

Source: http://dx.doi.org/10.1080/07438141.2010.536689

Resource Description

Communication:

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience:

audience to whom the resource is directed

Public

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Extreme Weather Event, Food/Water Quality, Food/Water Security, Precipitation, Temperature, Other Exposure

Extreme Weather Event: Drought, Flooding

Food/Water Quality: Biotoxin/Algal Bloom, Pathogen, Other Water Quality Issue

Water Quality (other): pH; Turbidity; Nitrogen; Phosphorus; Cyanobacteria; Water temperature; Chlorophyll a concentration

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

Freshwater

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Australasia

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Cryptosporidiosis, Giardiasis

Resource Type: ☑

format or standard characteristic of resource

Policy/Opinion, Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content